

IN THE CLAIMS:

Please amend the claims as indicated below:

1. (Original) A receiver for processing an optical signal, comprising:  
5 a photo-detector for converting said optical signal to an electrical signal; and  
an equalizer for removing intersymbol interference from said electrical signal,  
said equalizer having a plurality of coefficients configured to be updated based upon a least-  
mean  $2N^{\text{th}}$ -order (LMN) algorithm, where N is greater than one.

10 2. (Original) The receiver of claim 1, further comprising a controller to update said  
coefficients based upon a least-mean  $2N^{\text{th}}$ -order (LMN) algorithm, where N is greater than one.

3. (Original) The receiver of claim 2, wherein said equalizer is a finite impulse  
response filter configured to produce a first output signal responsive to said electrical signal, said  
15 first output signal being representative of a sum of the associated electrical signal plus a  
weighted sum of previous ones of the electrical signal, wherein the previous signals are weighted  
by said coefficients.

4. (Original) The receiver of claim 3, further comprising:  
20 a slicer to produce a predicted signal for each first output signal received from the  
finite impulse response filter;  
a subtractor to produce an error signal proportional to the difference between said  
first output signal and a corresponding predicted signal or training signal; and  
a controller configured to update said coefficients responsive to the error signal.

25 5. (Original) The receiver of claim 4, wherein said slicer is configured to produce  
the predicted signal by adaptively determining a slicing threshold.

6. (Original) The receiver of claim 4, wherein said equalizer is a feed forward equalizer and said controller is configured to update a set of said coefficients  $\bar{c}(k+1)$  at a time (k+1) as  $\bar{c}(k) + \beta N[e(k)]^{2N-1} \bar{u}(k)$ , wherein  $\beta$  is a preset step size,  $\bar{c}(k)$  and  $e(k)$  are respective set of coefficients and error signals at a time k, and  $\bar{u}(k)$  is an input signal at the time k.

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7. (Original) The receiver of claim 1, wherein the equalizer is a digital filter.

8. (Original) The receiver of claim 2, wherein the equalizer is an analog filter.

10 9. (Original) The receiver of claim 3, further comprising:

a first subtractor to produce a second output signal, said second output signal being a sum of one of the first output signals and a corresponding feedback signal;

a slicer to produce a predicted signal in response to each second output signal;

15 a second subtractor to produce an error signal representing a difference between the second output signal and a corresponding training signal or predicted signal;

a feedback filter to produce the feedback signal in response to corresponding ones of the predicted or training signals, the feedback signal being a weighted sum of the predicted or training signal, wherein weights in the sum being characteristics of the filter; and

20 a controller to update the weights in response to the error signal, the controller configured to perform the updates based upon a least-mean  $2N^{\text{th}}$ -order (LMN) algorithm where N is greater than one.

10. (Original) The receiver of claim 9, wherein said equalizer is a decision feedback equalizer and said controller is configured to update a set of the weights  $\bar{w}(k+1)$  at a time (k+1)  
25 as  $\bar{w}(k) + \beta N[e(k)]^{2N-1} \bar{r}(k)$ , wherein  $\beta$  is a preset step size,  $\bar{w}(k)$  and  $e(k)$  are respective sets of weight and error signals at a time k, and  $\bar{r}^T(k) = [\bar{u}(k), -\bar{a}(k)]$ , where  $\bar{u}(k)$  is an input signal at the time k, and  $\bar{a}(k)$  is a predicted or training signal at the time k.

11. (Previously Presented) A receiver for processing an optical signal, comprising:  
a photo-detector for converting said optical signal to an electrical signal;  
an equalizer for removing intersymbol interference from said electrical signal;  
a slicer to produce a predicted signal in response to each input signal based upon a  
5 slicing threshold, wherein said slicing threshold is varied based upon a signal distribution of said  
electrical signal; and  
a threshold control algorithm to track said signal distribution of said electrical  
signal and adjust said slicing threshold for a reduced bit error rate of said predicted signal.

10 12. (Cancelled)

13. (Currently Amended) The receiver of claim 11 ~~12~~, wherein said threshold control  
algorithm accumulates said signal distribution information within a window of finite duration to  
allow tracking of slowly varying non-stationary channels

15 14. (Original) A method for processing an optical signal, comprising the steps of:  
converting said optical signal to an electrical signal;  
removing intersymbol interference from said electrical signal using an equalizer,  
wherein said equalizer has a plurality of coefficients; and  
20 updating said plurality of coefficients based upon a least-mean  $2N^{\text{th}}$ -order (LMN)  
algorithm where N is greater than one.

15. (Original) The method of claim 14, wherein said equalizer is a finite impulse  
response filter that is further configured to produce a first output signal responsive to said  
25 electrical signal, said first output signal being representative of a sum of the associated electrical  
signal plus a weighted sum of previous ones of the electrical signal, wherein the previous signals  
are weighted by said coefficients.

16. (Original) The method of claim 15, further comprising the steps of:  
producing a predicted signal for each first output signal received from the finite  
impulse response filter;  
producing an error signal proportional to the difference between said first output  
5 signal and a corresponding predicted signal or training signal; and  
updating said coefficients responsive to the error signal.

17. (Original) The method of claim 16, further comprising the step of updating a set  
of the coefficients  $\bar{c}(k+1)$  at a time  $(k+1)$  as  $\bar{c}(k) + \beta N[e(k)]^{2N-1} \bar{u}(k)$ , wherein  $\beta$  is a preset  
10 step size,  $\bar{c}(k)$  and  $e(k)$  are respective set of coefficients and error signals at a time  $k$ , and  
 $\bar{u}(k)$  is an input signal at the time  $k$ .

18. (Original) The method of claim 15, further comprising the steps of:  
producing a second output signal, said second output signal being a sum of one of  
15 the first output signals and a corresponding feedback signal;  
producing a predicted signal in response to each second output signal;  
producing an error signal representing a difference between the second output  
signal and a corresponding training signal or predicted signal;  
producing the feedback signal in response to corresponding ones of the predicted  
20 or training signals, the feedback signal being a weighted sum of the predicted or training signal,  
wherein weights in the sum being characteristics of the filter; and  
updating the weights in response to the error signal, the controller configured to  
perform the updates based upon a least-mean  $2N^{\text{th}}$ -order (LMN) algorithm where  $N$  is greater  
than one.

19. (Original) The method of claim 18, further comprising the step of updating a set  
of the weights  $\bar{w}(k+1)$  at a time  $(k+1)$  as  $\bar{w}(k) + \beta N[e(k)]^{2N-1} \bar{r}(k)$ , wherein  $\beta$  is a preset step

size,  $\bar{w}(k)$  and  $e(k)$  are respective sets of weight and error signals at a time  $k$ , and  $\bar{r}^T(k) = [\bar{u}(k), -\bar{a}(k)]$ , where  $\bar{u}(k)$  is an input signal at the time  $k$ , and  $\bar{a}(k)$  is a predicted or training signal at the time  $k$ .

5     20            (Previously Presented) A method for processing an optical signal, comprising the steps of:

                 converting said optical signal to an electrical signal;

                 removing intersymbol interference from said electrical signal;

10            producing a predicted signal in response to each input signal based upon a slicing threshold;

                 varying said slicing threshold based upon a signal distribution of said electrical signal; and

                 tracking said signal distribution of said electrical signal and adjusting said slicing threshold for a reduced bit error rate of said predicted signal

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21.            (Cancelled)

22.            (Currently Amended) The method of claim 20 ~~21~~, further comprising the steps of accumulating said signal distribution information within a window of finite duration to allow  
20     tracking of slowly varying non-stationary channels.